ArcelorMittal

Granite® HDX at a glance

Contents

Granite® HDX at a glance

Cover image: Social housing units in Salburua, Spain
Architect:© IDOM-ACXT
Photograph: © Aitor Ortiz

Reliable pre-painted steels

Granite® HDX is a uniquely beautiful, resilient, and sustainable pre-painted steel for outdoor and indoor applications.

It combines best-in-class corrosion and UV protection with durability and an aesthetic colour palette. Granite® HDX brings inspiration, performance, and protection to suit your building projects.

Granite® HDX is produced at different ArcelorMittal mills located across Europe. Our proximity offers customers a larger choice while reducing transport costs and CO_2 emissions. ArcelorMittal's integrated production process ensures full traceability and a high level of quality.

Granite® HDX is part of ArcelorMittal's **Nature** range. That means it is free of hexavalent chromium and heavy metals and in full compliance with the European Union's REACH regulation. Certified by BBA (The British Board of Agrément) and CSTB (Centre Scientifique et Technique du Bâtiment) among others, Granite® HDX contributes to credits in green building rating systems such as LEED (Leadership in Energy and Environmental Design) and BREEAM (Building Research Establishment Environmental Assessment Method).

The extreme workability, durability, and versatility of this pre-painted steel has led to its wide adoption in the building industry where it is used for wall cladding and roofing applications.

Granite® HDX combines ArcelorMittal's advanced coil coating technology with a selection of high-quality paint systems. This guarantees its aesthetic appearance and long-term durability.

Pre-painted production line
Photograph: © Jeroen Op de Beeck

ArcelorMittal

High-Durability eXtended

Technically and aesthetically, Granite® HDX is the best-in-class product from ArcelorMittal's range of pre-painted steels.

Nspired by Nature

guarantee 35 years free of chromates and heavy metals

Benefits of using Granite® HDX

- Enduring and robust pre-painted steel for harsh weather conditions or aggressive environments with RC5 (corrosion resistance category) certification, the best-in-class corrosion resistance category according to EN 10169.
- Colours remain stable and attractive, even in the coldest northern climates or the most sun-drenched southern countries with RUV4 (UV resistance category) certification, the best-in-class UV resistance according to EN 10169.
- Extended performance supported by a unique automatic guarantee of up to 35 years against perforation and delamination of the paint film.
- Aesthetic colour palette ranging from metallic shades to solid colours with a slightly grained surface. The standard gloss is 30 GU, other gloss levels are available on request.
- High-performance paint system which allows shape-freedom thanks to the excellent flexibility of the polyurethane paint. Scratch resistance is assured by the grained surface of Granite® HDX.
- Traceability and quality are guaranteed thanks to ArcelorMittal's fully integrated production flow.
- Sustainable: as part of ArcelorMittal's **Nature** Collection, Granite® HDX does not contain any harmful substances and complies with current and future European Union REACH regulations. It also addresses the challenge of sustainable construction labels with an Environment Product Declaration (EPD). The EPD provides guidance to designers who wish to comply with sustainability labels such as BREEAM in the UK, LEED in the USA, HQE (Haute Qualité Environnementale) in France, A+ certification in France for low VOC (Volatile Organic Compounds) emission according to the most demanding European regulations and many others.

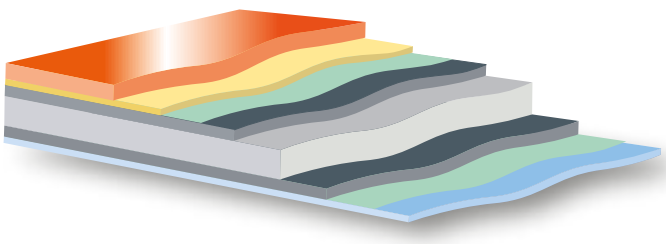
The product

Granite® HDX pre-painted steel is a tough, but highly attractive and versatile product which will help any external construction project look better and last longer.

In terms of durability, Granite® HDX is the best-in-class product on the market. It is composed of several layers for a total paint coating of 55 µm.

Each layer performs a different but integral function. The layers include:

- A 30 µm thick paint layer on top to ensure durability and longevity compared to regular polyester and smooth paints. Known as the top coat, this layer provides surface robustness, resistance to abrasion and UV weathering.
  The final aesthetic appearance (colour, gloss, and surface structure) is provided by this top coat. Polyamide balls are embedded in the top layer to reduce the chance of damage during handling and processing.
- A 25 µm thick primer layer plays a key role in corrosion protection. It ensures the top coat adheres strongly to the underlying metallic coated steel.
- A robust zinc metallic coating with a minimum of 225 g/m² (grams of zinc per square meter) protects the steel substrate from corrosion, even on cut edges. This coating is also available in 275 g/m².
- A premium 10 to 12 µm painted back-coat protects the steel substrate from corrosion and mechanical damage while providing a surface suitable for foam adhesion (if required by the final application).



Topcoat with polyamide balls
Corrosion resistant primer
Pre-treatment
Zinc metallic coating
Steel substrate
Zinc metallic coating
Pre-treatment
Back coat

Granite® HDX

High performance pre-painted steel

Thanks to its unique combination of high quality paint system and robust metallic steel substrate, Granite® HDX can withstand the most severe climatic conditions.

The Porsche Centre in Groningen, Netherlands
Architect: © VBJ Architectuur
Photograph: © Mark Sekuur, Prima Focus
Cladding system by SBC HollandGroep

Corrosion resistance

Classified RC5 – the best-in-class corrosion resistance category under EN 10169 – Granite® HDX ensures a durable construction.

The product has been fully tested by ArcelorMittal's Global R&D experts under extreme corrosion and weathering conditions. Tests have been conducted both in the laboratory, and at outdoor exposure sites across the world.

Accelerated laboratory corrosion tests

A battery of tests has been conducted in ArcelorMittal's laboratories to predict the corrosion behaviour of Granite® HDX in different environments including coastal, highly humid, and sandy locations. Specific tests representative of acid rains or chemicals were also conducted. Rigourous tests evaluated the capacity of corrosion inhibitors to block anodic/cathodic reactions on edges and scribes. Permeability resistance and effectiveness of the topcoat as a barrier to corrosion are also evaluated. Tests performed include salt spray tests and condensation resistance tests (QCT).

Although they are a good guide to behaviour of the product in-situ, accelerated laboratory tests are not fully representative of real life conditions in all environments. For this reason, ArcelorMittal also carries out natural weathering tests in a range of locations.

Condensation cabinet

Salt-spray cabinet
Photographs: © Arcelormittal Global R&D

Corrosion resistance

Natural exposure

The EN 10169 European standard requires pre-painted steels to be exposed to natural conditions at a range of sites for at least two years. A RC corrosion resistance category can be granted only after this outdoor tests are completed on samples from industrial production.

To obtain the RC5 certification achieved by Granite® HDX, the pre-painted product must withstand blistering, coating damage, and show edge delamination below 2 mm.

ArcelorMittal also commissions further extensive testing by independent assessors and laboratories to achieve third-party certifications. For example, the French Corrosion Institute has independently certified Granite® HDX as RC5.

Several exposure sites are used to represent different climates including marine coastal, industrial, and rural (as recommended by EN 10169 and in compliance with EN ISO 12944). ArcelorMittal's test site in Brest (France) is a C5M marine site and monitored by the French Corrosion Institute. ArcelorMittal's experience in natural, outdoor exposure sites goes far beyond the requirements of the standard.

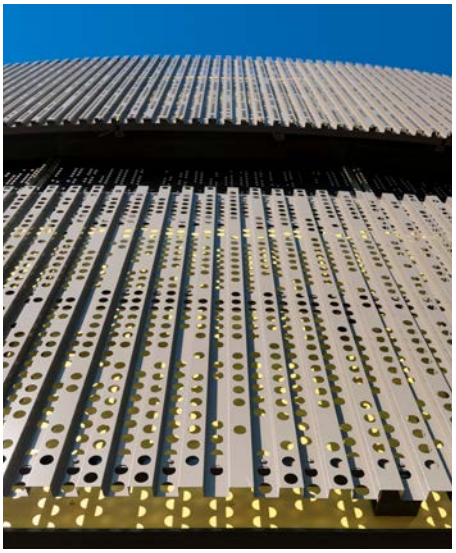
This Granite® HDX facade was erected more than 10 years ago in a heavy industrial environment close to the ArcelorMittal coking plant in Dunkerque (France).
No defects have been observed on bends and the building has maintained its aesthetic look, even in this harsh industrial and marine environment.
Photographs: © ArcelorMittal

Corrosion resistance

Natural exposure

With more than 10 years of natural exposure in severe environments such as Brest, ArcelorMittal is confident in the performance of Granite® HDX. That enables us to offer automatic guarantees for the chromium-free paint system and surface treatment of Granite® HDX.

Rigorous laboratory and outdoor exposure tests are consolidated by regular inspections of roofs and facades where Granite® HDX has been utilised. This enables ArcelorMittal to have full confidence in our long-term automatic guarantees.



The facade of the Stoas Vilentum University in the Netherlands uses perforated, double-sided Granite® HDX.
The cathodic protection of zinc prevents the cut edges of the perforations from corroding for many decades.
Architect: © BDG Architecten Ingenieurs Zwolle
Photographs: © Dirk Verwoerd

Corrosion resistance

Natural exposure

Requirements for natural outdoor resistance tests

EN 10169	Corrosion resistance category	Test duration (years)	Average edge delamination (mm)	Damage on bend	Blistering
	RC5	≥ 2	≤ 2	d*	2(S2)

** It shall be checked that no bursting of the organic coating occurs and that there is no apparent corrosion product at the progressive radius bend; in an area located at a distance between 10 and 50 mm from the 3 T side panel edge of the specimen.*

Test panel after 24 months of outdoor exposure in Brest (French Corrosion Institute). ArcelorMittal's testing is more severe than described in the EN 13523-19 standard and represents real-life roofing and facade conditions. For example:

- *Scribes are systematically included in the samples for two inclinations.*
- *One scribe line goes down to the steel substrate, and not just the metallic coating*
- *Two distinctive bends are included: 1T and 3T.*

Photograph: © ArcelorMittal Global R&D

ArcelorMittal's weathering site in Brest (France) is managed by the French Institute of Corrosion.
Photograph: © ArcelorMittal

Institut de la Corrosion
French Corrosion Institute
EXP-FOR-252-0
Coil – Field - Assessment EN 10169

Technopôle de Brest Iroise
220, Rue Pierre Rivoalon – 29220 Brest, France.
Tel : +33 (0)298 051 552 - Fax : +33 (0)298 050 894

Advanced Coatings & Construction Solution
Boulevard de Colonster B57
Campus Universitaire du Sart Tilman
B-4000 LIEGE BELGIQUE

Evaluation of the corrosion resistance of coil-coated materials in marine atmosphere C5M (Brest)

Reference: **BR2010UAug008**

Date of start of exposure:	10/08/2010
Accumulative Time of Exposure:	24 months

Conclusions:	The coil coated material ref ***BR2010UAug008 may*** be classified RC5 according to standard EN10169 (C5M)	
Brest August ,21st 2014		
Written by : Jean-Michel Hamoignon	**Approved by :** Nathalie Le Bozec	**Stamp** Institut de la Corrosion French Corrosion Institute

Example of RC5 certificate for Granite® HDX

ArcelorMittal

UV weathering resistance

After corrosion resistance, ultra-violet (UV) weathering is the second most important attribute for customers who use pre-painted steels in construction.

Granite® HDX is rated RUV4 – the highest UV resistance category according to EN 10169. That means the Granite® HDX paint system will maintain its colour and gloss over time, even in the most extreme climates.

While visible sunlight and near-infrared (NIR) radiation can degrade the appearance of a pre-painted steel, it can also be affected by a mixture of environmental stresses including:

- Moisture from exposure to dampness or the relative humidity of the local environment
- Maximum and minimum temperatures as well as daily variations in the temperature range
- Wind, rain, and sand abrasion
- Salts from industrial or coastal environments
- Deposits of soil and pollutants.

In order to understand how Granite® HDX behaves and resists UV corrosion in a variety of environments, the pre-painted steel is subjected to a battery of accelerated tests in our laboratory. These accelerated tests are complemented by natural outdoor exposure tests which are carried out at locations around the world.

UV weathering resistance

Accelerated UV weathering tests

UV weathering is evaluated by exposing a pre-painted sample of Granite® HDX to accelerated UV, humidity, and temperature variations for 2,000 hours.

Each cycle involves exposing the sample for four hours to UVA radiation in dry conditions at 60°C. This mimics the radiation received from the sun. The sample is then exposed to condensation at 40°C without UV radiation for another four hours.

After 2,000 hours of exposure, the sample is evaluated to determine the level of colour change and gloss retention.

The full Granite® HDX colour chart has been classified at RUV4, the highest possible rating. This ensures that a building finished in Granite® HDX will maintain its vivid colour and gloss for longer.

EN 10169-2: accelerated tests	UV resistance category		
Requirements	RUV 2	RUV 3	**RUV 4**
Maximum colour change ΔE [a] before and after the test (CIELAB Units)	5	3	**2**
Minimum retained gloss after the test (RG [b])	30%	60%	**80%**

[a] The ΔE value is not applicable for saturated and other special colours such as metallics and pearlescent. In that case the colour change verification method and its acceptance value shall be agreed at the time of enquiry and order.

[b] RG is the ratio of the final gloss value, expressed as a percentage.

Granite® HDX test panels at the Station d'Essais de Vieillissement Naturel (SEVN) in Sanary-sur-Mer, France. Photograph: © ArcelorMittal Global R&D

Natural exposure

ArcelorMittal also carries out tests in the natural environment in accordance with EN 10169. The standard requires that:

- Samples are exposed at a 45° angle to the sun
- Selected sites must have a minimum annual solar radiation exposure of 4,500 MJ/m²
- The samples must be exposed at least for two years.

Gloss and colour changes are monitored during the testing period and after two full years of exposure.

ArcelorMittal uses several natural exposure sites, such as Sanary-sur-Mer as an example, which have an annual cumulative solar energy level higher than 4,500 MJ/m². The sites are managed by external third parties and utilise samples from ArcelorMittal's industrial production process.

EN 10169: outdoor tests	UV resistance category		
Test requirements	RUV 2	RUV 3	**RUV 4**
Maximum colour change ΔE (CIELAB Units)	5	3	**3**
Minimum retained gloss after the test	30%	50%	**80%**
Example of location	North of about 45°N altitude ≤ 900 m	South of about 45°N and North of about 37°N altitude ≤ 900 m	South of about 45°N every region with altitude ≥ 900 m

UV weathering resistance

ArcelorMittal's experience in natural outdoor exposure testing goes far beyond the requirements of the EN 10169 standard. For example, some colours are exposed more than 4 years.

Rigorous laboratory and outdoor exposure tests are complemented by regular inspections of roofs and facades finished in Granite® HDX. This enables ArcelorMittal to be fully confident that Granite® HDX can meet the unique automatic guarantees we provide.

ASTM Standard

Granite® HDX has been submitted to a variety of tests against the ASTM International standard for corrosion and UV resistance. Please contact us for more details on the ASTM test results.

SEVAR Sarl

75 rue Cuvier, BP 24
81350 BANDOL
FRANCE

Evaluation of UV resistance of a prepainted steel panel after 5 years of natural weathering in Bandol (> 4500 MJ/m²/year)

Reference : BAN-Q80

Exposure Angle: 45° South

Starting date for exposure:	**15/11/2011**
Date for final measurements:	**15/11/2016**
Duration of exposure :	**5 years**

Reference	Initial gloss (G.U.)	Initial parameters Colorimetry			Gloss after 5 years (G.U.)	Final parameters Colorimetry			Delta E*	Gloss retention (%)
		L*	a*	b*		L*	a*	b*		
BAN Q80	35,0	34,58	-1,08	-2,54	33,2	37,27	-1,18	-3,30	**2,79**	**95**
									RUV4	

Conclusions :	The product referenced Q80,Granite® HDX in Umbra grey – G7022 fulfills RUV4 criteria after 5 years of outdoor exposure following EN10169 clause 6.3.3.3.2, b, table 8

Bandol, the 18/12/2017

Report written by	**Approved by**	
Bojana BERAUD	**Lionel BERAUD**	

1/2

Example of an RUV4 certificate for Granite® HDX delivered by the third-party organisation SEVN Bandol after five years of exposure.

Main technical features and performances

Description	Thickness (1)	55 microns (paint coating) 0.4 mm, below upon request (steel)
	Width	660 to 1500 mm (above upon request) Slit coils and sheets are available directly from ArcelorMittal Distribution Services (AMDS) and other leading steel service centres.
	Composition	Front: 25 microns primer + 30 microns top coat Back: 10 or 12 microns backing coat Double-side finish available
	Gloss (Gardner 60°) (1)	30 GU Other gloss levels on request
	Colours	Colour palette
	Appearance	Grained
Performance	Adhesion of the coating (T-bend)	≤ 1 T
	Resistance to cracking on bending (T-bend)	≤ 1.5 T
	Impact resistance	18 J
	Clemen scratch resistance	≥ 3 kg
	Corrosion resistance: • Salt spray test • Corrosion resistance category	 700 hours RC5
	UV resistance: • UV resistance category • QUV (UVA + H_2O) test (2000 hours)	 RUV4 $\Delta E \leq 2$; GR ≥ 80%
	Fire behaviour classification (EN 13501-1)	A1 for colour class 1 to 4, A2 for metallic colour class 5
Remarks	These performance characteristics refer specifically to metallic coating Z225 (guaranteed minimum). If any product (film, oil, foam, glue, paint etc) is to be applied after coil delivery, compatibility with the coating needs to be checked first. Although we take great care to reproduce the same aesthetic aspect on each coil, ArcelorMittal cannot guarantee the visual consistency from one batch to another. Consequently, you need to consider placing one single order for one building; standard samples can only serve as a guide.	

(1) Nominal value, tolerance according to EN 10169

Discover the full technical data sheet at
industry.arcelormittal.com/flipflop/fce/Brochures/GraniteHDX_datasheet_EN

BBA Certification

The British Board of Agrément (BBA) has issued certificate 17/5415 for Granite® HDX. BBA is the UK's major authority for the approval of construction products, systems, and installers.

The BBA certificate notes that Granite® HDX successfully passed all tests relating to: weather tightness, resistance to wind uplift, fire resistance, location, workability, and durability for external roofing, cladding, or internal lining.

ArcelorMittal Commercial UK Limited
Fore 2, 3rd Floor
Huskisson Way
Solihull
West Midlands B90 4SS

Tel: 0121 713 6600 Fax: 0121 745 7350
website: www.industry.arcelormittal.com

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
17/5415
Product Sheet 3

ARCELORMITTAL COIL-COATED STEEL COIL AND SHEET

GRANITE HDX

This Agrément Certificate Product Sheet(1) relates to

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 23 May 2017

John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

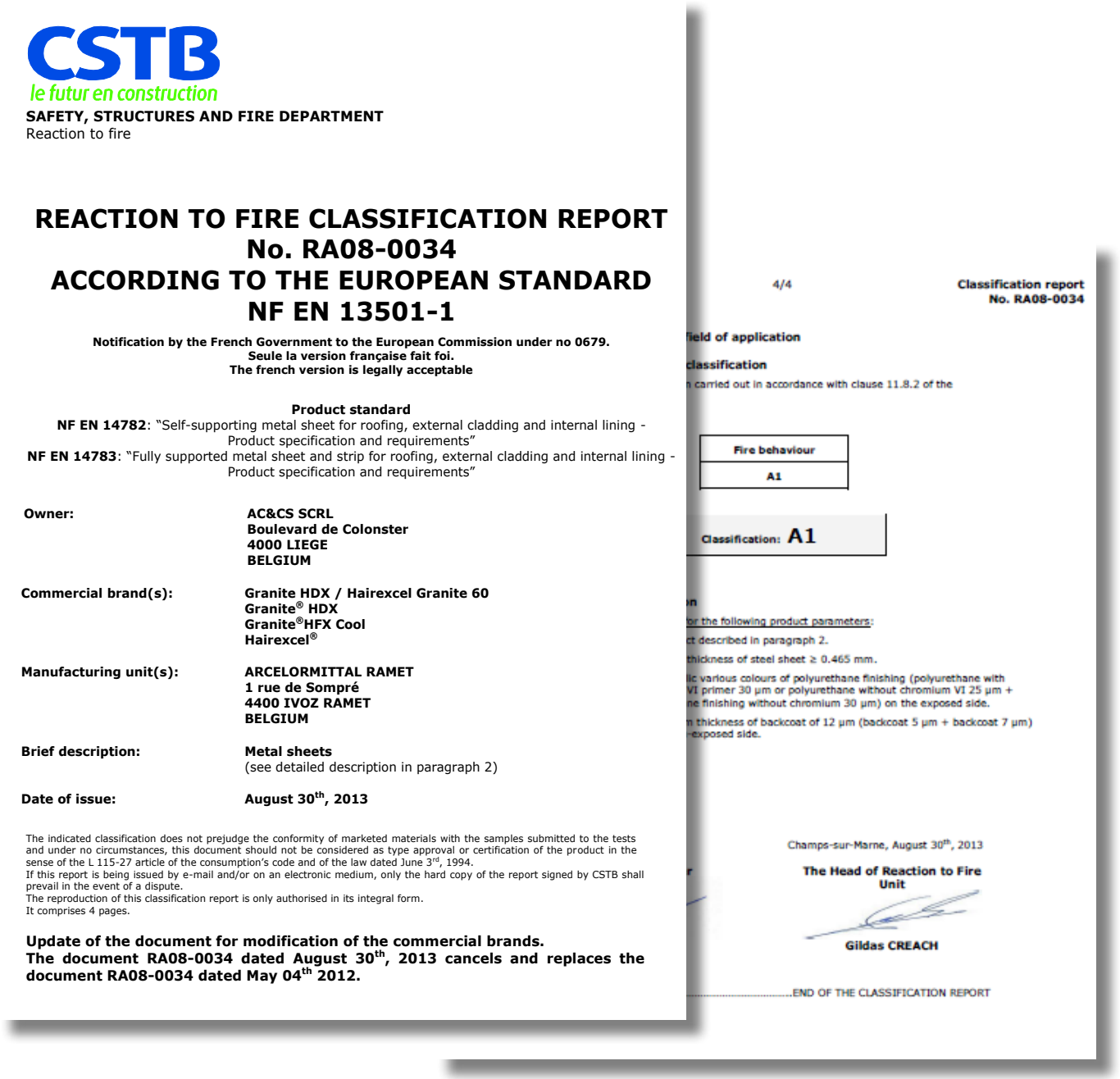
Certifications

As a material, steel is inflammable and does not contribute to the flames spreading. When combined with other materials, steel can be used to create fire-resistant panels, partitions, and doors and facades.

Fire resistance classification by CSTB

Granite® HDX has an A1 fire resistance classification in accordance with EN 13501-1. This classification was granted by CSTB, France's national organisation for testing and certification of construction products.

Granite® HDX has also been classified as a Class 1 material (the highest rating) against the surface spread of flames. The certification meets the class definition according to the British standard BS476-7:1997.



CSTB
le futur en construction

SAFETY, STRUCTURES AND FIRE DEPARTMENT
Reaction to fire

REACTION TO FIRE CLASSIFICATION REPORT
No. RA08-0034
ACCORDING TO THE EUROPEAN STANDARD
NF EN 13501-1

Notification by the French Government to the European Commission under no 0679.
Seule la version française fait foi.
The french version is legally acceptable

Product standard
NF EN 14782: "Self-supporting metal sheet for roofing, external cladding and internal lining - Product specification and requirements"
NF EN 14783: "Fully supported metal sheet and strip for roofing, external cladding and internal lining - Product specification and requirements"

Owner:	**AC&CS SCRL** **Boulevard de Colonster** **4000 LIEGE** **BELGIUM**
Commercial brand(s):	**Granite HDX / Hairexcel Granite 60** **Granite® HDX** **Granite®HFX Cool** **Hairexcel®**
Manufacturing unit(s):	**ARCELORMITTAL RAMET** **1 rue de Sompré** **4400 IVOZ RAMET** **BELGIUM**
Brief description:	**Metal sheets** (see detailed description in paragraph 2)
Date of issue:	**August 30th, 2013**

The indicated classification does not prejudge the conformity of marketed materials with the samples submitted to the tests and under no circumstances, this document should not be considered as type approval or certification of the product in the sense of the L 115-27 article of the consumption's code and of the law dated June 3rd, 1994.
If this report is being issued by e-mail and/or on an electronic medium, only the hard copy of the report signed by CSTB shall prevail in the event of a dispute.
The reproduction of this classification report is only authorised in its integral form.
It comprises 4 pages.

Update of the document for modification of the commercial brands.
The document RA08-0034 dated August 30th, 2013 cancels and replaces the document RA08-0034 dated May 04th 2012.

4/4 **Classification report No. RA08-0034**

ield of application

classification

carried out in accordance with clause 11.8.2 of the

Fire behaviour
A1

Classification: **A1**

or the following product parameters:

ct described in paragraph 2.

thickness of steel sheet ≥ 0.465 mm.

ic various colours of polyurethane finishing (polyurethane with VI primer 30 µm or polyurethane without chromium VI 25 µm + ne finishing without chromium 30 µm) on the exposed side.

n thickness of backcoat of 12 µm (backcoat 5 µm + backcoat 7 µm) -exposed side.

Champs-sur-Marne, August 30th, 2013

The Head of Reaction to Fire Unit

Gildas CREACH

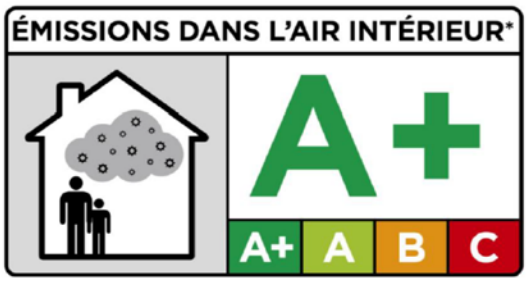
END OF THE CLASSIFICATION REPORT

Certifications

Volatile organic compound (VOC) certification

Granite® HDX emits very low levels of volatile organic compounds (VOCs) and has been certified A+ by Certech (Centre de Ressources Technologiques en Chimie). The certification meets the standards defined in ISO 16000-9 and follows the requirements of the French directive 2011-321, the royal decree in Belgium (May 2015, C-2014/24239), the german regulations AgBB (February 2015) and DIBt (October 2010) for the labelling of construction products by a third party.

certech
centre de ressources technologiques en chimie



** Information représentative des émissions dans l'air intérieur des substances volatiles présentant un risque de toxicité par inhalation, sur une échelle de classe allant de C (fortes émissions) à A+ (très faibles émissions)*

Granite® HDX

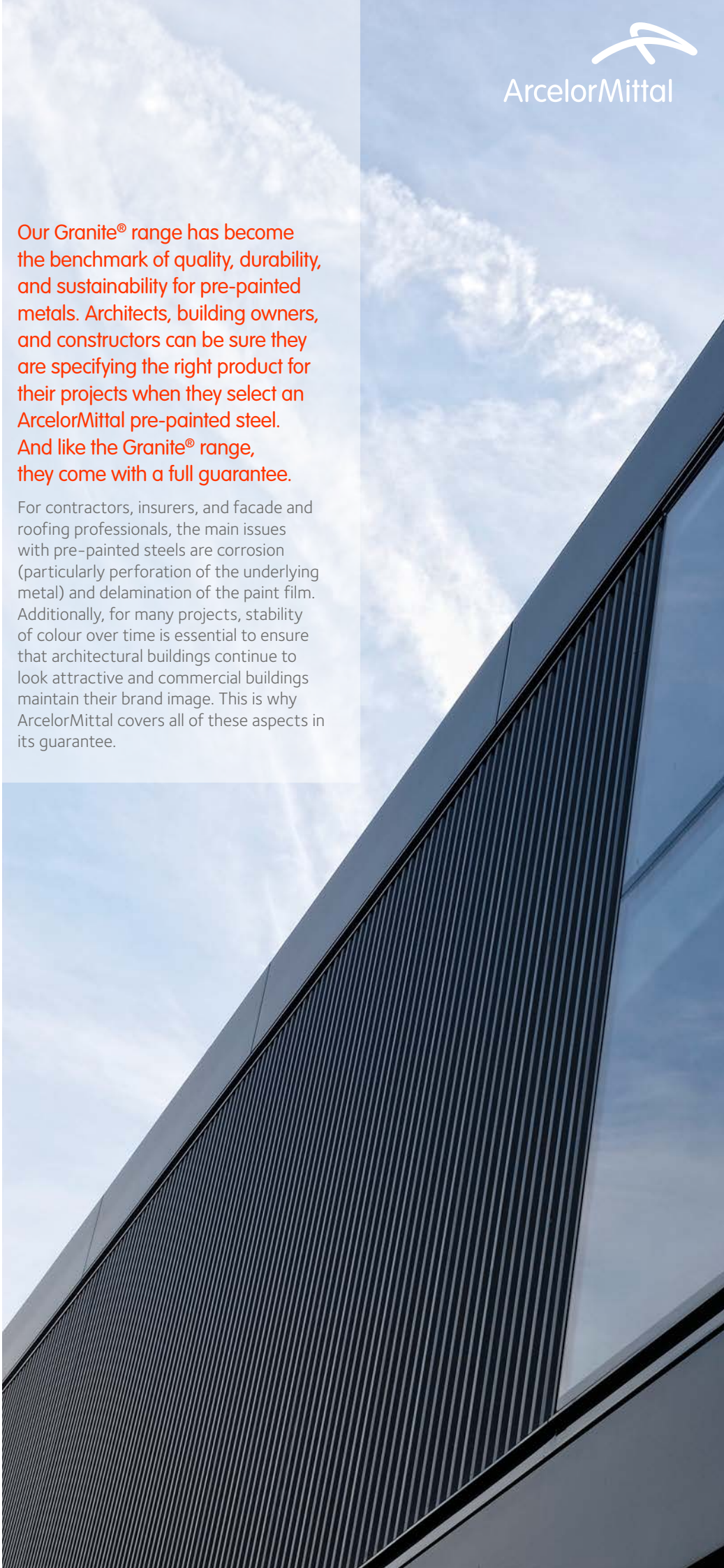
The automatic guarantee

With more than 50 years of experience in Europe, ArcelorMittal has had the opportunity to analyse how our products actually behave in different areas. Today we are in the perfect position to assess the effects of time on our pre-painted steels.

ArcelorMittal's integrated production process, from hot strip mill through to coil coating, ensures full traceability and a high level of quality. Our latest innovations in coating systems increase the lifetime of ArcelorMittal's construction products, and reduce their environmental impact.

Our Granite® range has become the benchmark of quality, durability, and sustainability for pre-painted metals. Architects, building owners, and constructors can be sure they are specifying the right product for their projects when they select an ArcelorMittal pre-painted steel. And like the Granite® range, they come with a full guarantee.

For contractors, insurers, and facade and roofing professionals, the main issues with pre-painted steels are corrosion (particularly perforation of the underlying metal) and delamination of the paint film. Additionally, for many projects, stability of colour over time is essential to ensure that architectural buildings continue to look attractive and commercial buildings maintain their brand image. This is why ArcelorMittal covers all of these aspects in its guarantee.



Werkgebouw Post Zuid, Apeldoorn, Netherlands
Architect: ©COURAGE architecten & MIES architectuur
Photograph: © Ian Beck

The automatic guarantee

The unique advantages of the Granite® guarantee

- **The guarantee is automatic in Zones 1 and 2 (Europe)**
  As a direct customer, you are automatically covered when you buy Granite®. There is no need to register, giving you the assurance that your projects are systematically protected.

- **Same guarantee duration for roofing or cladding**
  Whatever the end application – roof or facade – we offer the same length of guarantee.

- **Guarantee covers aesthetics**
  Aesthetic properties such as gloss and colour are covered automatically. UV guarantee length may vary depending on whether you select metallic or solid colors according to their classification.

Sittomat incineration and waste disposal plant in Toulon (France)
Architect : © FOGACCI + FOGACCI ARCHITECTES
Photograph: © Rithideth Kitisrivoraphanh

The automatic guarantee

Duration of guarantee based on environment (Europe)

Guarantee covers non-perforation of the sheet metal and non-delamination of the paint film.

For some applications, locations, or environments outside the general automatic guarantee area, ArcelorMittal offers specific guarantees on a case-by-case basis.

If the construction is less than 300 metres from the coast, an environmental questionnaire must be completed. This will enable ArcelorMittal to provide the best guarantee, specifically adapted to your project.

Please consult ArcelorMittal if you have any questions.

External environment		Corrosivity category as per EN 10169	Granite® HDX[1] on metal coating minimum: Z275 / ZA255 Thickness 55 µm
Rural	Unpolluted	C2	**35** years
Urban and/or Industrial	Moderate pollution	C3	**30** years
Industrial	High pollution	C4	**20** years
Marine	3 to 20 km	C3	**30** years
	1 to <3 km	C4	**20** years
Coastal	300 m to <1 km	C5M	**15** years
Altitude > 900 m	Strong UV		**15** years

[1] Backing coat 12 µ minimum mandatory except for foamed sandwich panels.

For a Z225 metal coating, the length of the automatic guarantee is reduced. A minimum 10 µm back coat is mandatory for all applications except foamed sandwich panels. Please consult ArcelorMittal.

Find the European map on the next page or for full details consult:
industry.arcelormittal.com/market-segments/construction/36/buildingguarantees

The automatic guarantee

Guarantee zones

Coordinates of Zone 1:
- Above 42° north parallel
- Below 66° north parallel
- East of 12° west longitude
- West of 60° east longitude

* Guarantee extended to Iceland
(classed as Zone 1 for aesthetic guarantees)

Coordinates of Zone 2:
- Below 42° north parallel
- Above 37° north parallel
- East of 12° west longitude
- West of 25° east longitude

* Southern part of Spain, Italy, Greece and Bulgaria is covered by this Guarantee, as well as the eastern part of Greece above the 37° north parallel

* Guarantee extended to Armenia, Azerbaijan, Georgia, Tajikistan and Turkey (classed as Zone 2 for aesthetic guarantees)

In the event of any discrepancy between the map and the "coordinates", the "coordinates" shall prevail.

Granite® HDX

Long-lasting aesthetics

Thanks to its large colour palette, Granite® HDX offers designers and architects startling and generous design opportunities. The palette includes subtle grained finishes, bold solid colours, and scintillating metallics, all designed to match the unique identity of your building. Most colours are available in either a satin or low gloss finish.

Granite® HDX colours keep their sparkle, they retain their unblemished elegance in high traffic areas, and hold their deep rich colour, even through Mediterranean summers.

Highly attractive, Granite® HDX combines the best traits of pre-painted steel including high durability and colour stability, even in extreme environments.

ArcelorMittal Technology Development Centre in Avilés, Spain
Architect: © [baragaño] architects
Photograph: © Mariela Apollonio fotógrafa

The colour palette

A wide choice of colours ranging from light to dark shades

Colour consistency

Although it is produced on a diverse range of ArcelorMittal lines across Europe, the same colour is delivered everywhere, regardless of the production line. (Note: ArcelorMittal recommends that the same colour batch is always used for a complete project.)

Quality consistency

Master colours are kept by all production mills, allowing higher production consistency and reducing the risk of colour differences.

Production can be transferred to another mill if necessary without affecting quality or colour.

Reduced delivery time as colour matching is not required. All mills producing Granite® HDX keep colour samples in stock to ensure consistency across the company.

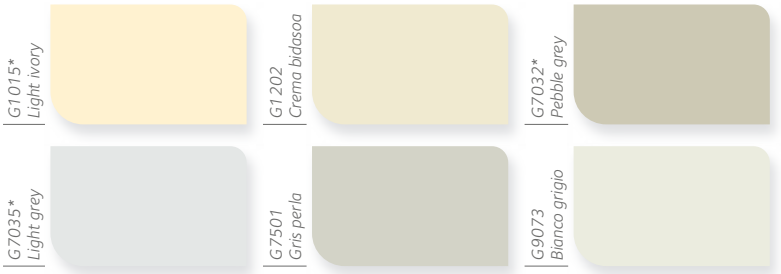
Philips Tower, Leuven
Photograph: © Tom D'Haenens

Granite® HDX
The colour palette

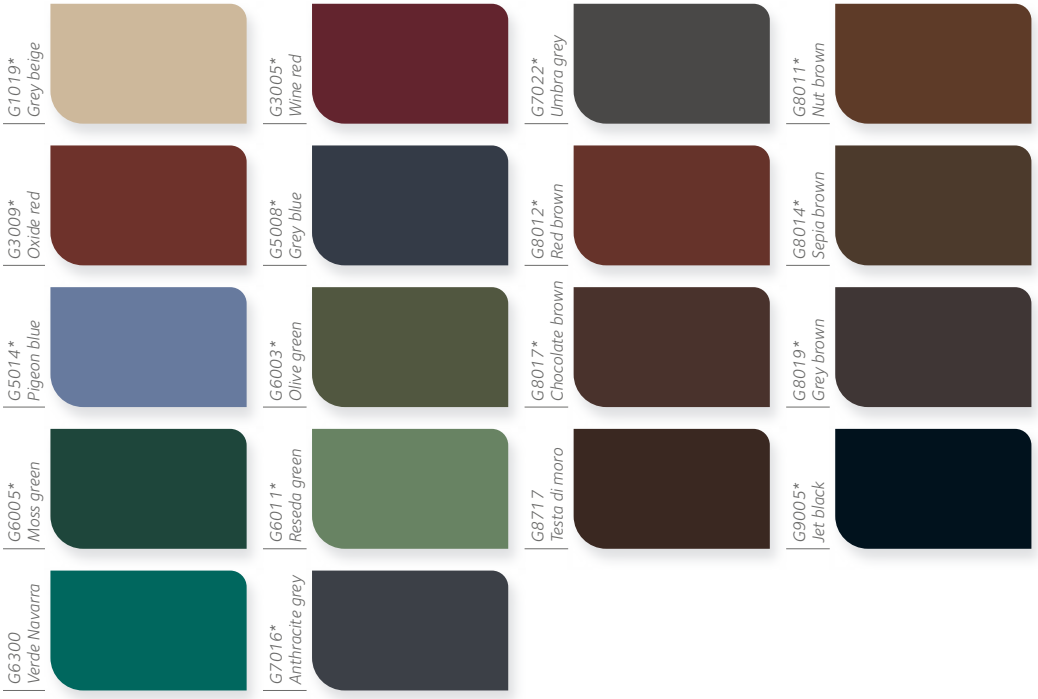
A wide choice of colours ranging from light to dark shades

Category 1: Classic Light

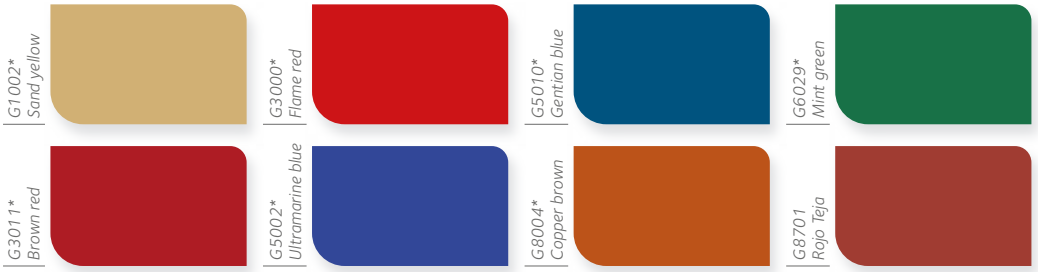
Category 2: Classic Medium



Category 3: Classic Dark



Category 4: Magic Saturated



Category 5: Magic Metallised

** Closest RAL code (approximation)*
Standard gloss: 30 GU. Some colours are available with different GU values and can be ordered on request. It may be possible to order specific colours which are not included in our standard offer after consultation with ArcelorMittal.

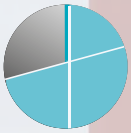
Granite® HDX

Common and specific applications

Granite® HDX is usually recommended for roofing and cladding applications. Additionally, it is also suitable for the manufacture of flashings and accessories, sandwich panels, cassettes, flat panels, profiled sheets, solar shading, fins, blades, and narrow elements.

Sandwich panels
Composite panels for insulated roofs and facades

Solar shading
Brise-soleil and other solar shading system components

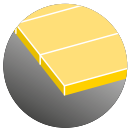


Cassettes and flat panels
Cassette panels systems for metal support systems and other flat panel types

Fins, blades and narrow elements
Specially formed narrow elements for a range of applications

Profiled sheets
Panels or sheets with curved or trapezoidal profiles

Specific applications



Decking
Formed profiles for short, medium and long-span decking

Cassettes and flat panels
Cassette panels for interior metal support systems and other flat panel types

Ceilings and partitions
Metal components for suspended ceiling systems or partition walls

Cold rooms

Granite® HDX is commonly recommended for use in light and non-aggressive environments (defined as Ai3 and Ai4 in the NF P34-301 standard).
This includes cold and humid environments used for the storage and preparation of salad, flowers, fruit, ice cream, butter production, meat, and wine.

Granite® HDX resists chemicals and offers good resistance to cleaning products.

Granite® HDX has the lowest level of VOCs leading to an A+ certification according to ISO 16000-9 and the French Directive 2011-321 on the labelling of construction products.

Cold room for food preparation
Photograph:
© Mehmet Cetin / shutterstock.com

Specific applications

Solar shading
Brise-soleil and other solar shading system components

Sandwich panels
Composite panels for insulated roofs and facades

Energy efficiency

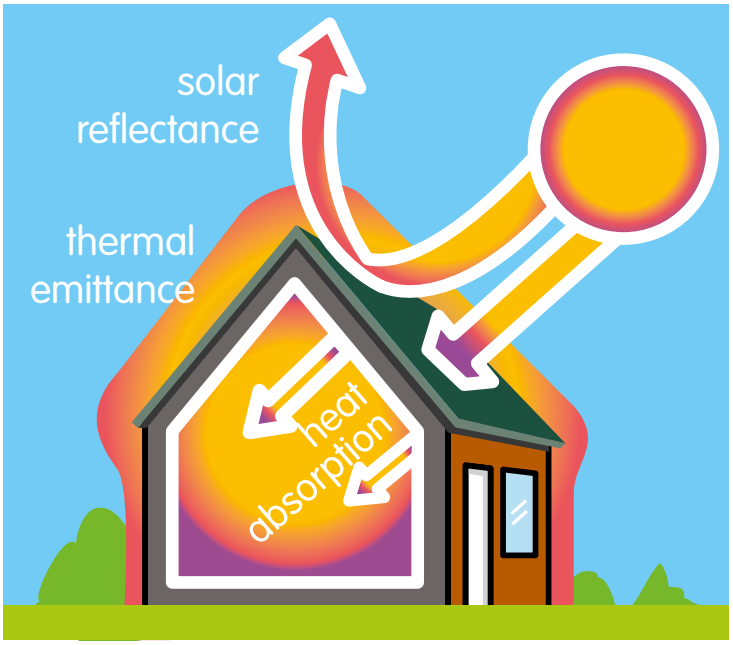
By combining Granite® HDX with reflective paint, designers and architects can help to mitigate the 'urban heat island' effect in cities. Energy savings of up to 15% can be achieved on air conditioning for single storey buildings with poor insulation. This helps to reduce air pollution and greenhouse gas emissions from energy production.

The reflectivity of a material affects its ability to reflect solar radiation back into the atmosphere. The proportion of solar radiation that can be reflected back to the atmosphere by the material is defined as its Total Solar Reflectance (TSR)(1).

The following Granite® HDX colours are available with an improved TSR for residential roofing applications:
Several colours are currenty available (i.e. anthracite grey G7016, red brown G8012 and wine red G3005).

Other colours can be proposed and tested on request to obtain the guaranteed SRI.

To meet the LEED standard's SRI(2) rating, Granite® HDX in whitish colours (or in Cat. 1 light colours) i.e. Pure White G9010 can be proposed upon request for steep and low-slope roofs (SRI typical value between 88 and 94).

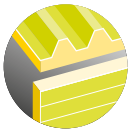


(1) Total Solar Reflectance (TSR) is the total amount of sunlight (including UV, visible, and near-infrared) reflected by a material and expressed as a percentage. The testing method is defined in ASTM E-903.

(2) Solar Reflectance Index (SRI) measures the ability of a constructed surface to stay cool in the sun by reflecting solar radiation and emitting thermal radiation. The testing method is defined in ASTM E 1980-01.

	SRI	
	LEED 2009	LEED V4
Steel slope roof (<2:12)	> 29	> 39
Low slope roof (≤2:12)	> 78	> 82

Specific applications



Sandwich panels
Composite panels for insulated roofs and facades

Solar energy generation systems

Granite® HDX can be used as support for photovoltaic (PV) systems on the roofs or facades of residential or semi-industrial buildings.

For a solar energy system to remain durable, PV panels must be generating more than 80% of their nominal energy after 20 years.

During the entire life of the system, the structure must continue to support the solar panels.
That requires a support structure which can withstand dead and climatic loads as well as the effects of corrosion and UV over time.

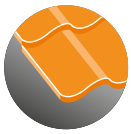
For this application, ArcelorMittal recommends the use of Granite® HDX with a 10 µm layer of paint on the back side applied to a galvanised steel with a 275 g/m² coating of zinc (Z275).

Photograph: © ArcelorMittal

Specific applications

Solar shading
Brise-soleil and other solar shading system components

Rainwater systems
Formable steel, painted both sides



Tile panels
Profiled and stamped panels replicating traditional roof tile shapes

Double-sided HDX

Granite® HDX is available with a double-sided coating. The same paint system is used for the top and bottom coat. A corrosion resistant primer must be applied to the reverse side of the metallic coated steel.

Double-sided Granite® HDX offers significant benefits for demanding applications like perforated profiles for solar shading systems or severe environments where a high level of corrosion resistance is required on both sides of the steel. This may occur in industrial, tropical, seaside, and desert zones. Guarantees are granted on a project-by-project basis.

For rainwater management systems, a flexible, double-sided Granite® HDX (known as Granite® Rain HDX) is available. It will improve the weathering resistance and barrier effect of gutters, downpipes, elbows, internal or external corners, outlets, and rainwater diverters. An automatic guarantee of up to 15 years is offered for Granite® Rain HDX for non-perforation. The exact length of the guarantee depends on the local external environment.

Photograph: © ArcelorMittal

Granite® HDX

Sustainable steel

When evaluating the sustainability of a building, it is essential to consider every phase of its lifecycle. That begins with the extraction of raw materials and includes production, transportation to the site, construction, operational use of the building, and eventual demolition or dismantling including waste disposal and/or recycling.

Photograph: © Jeroen Op de Beeck

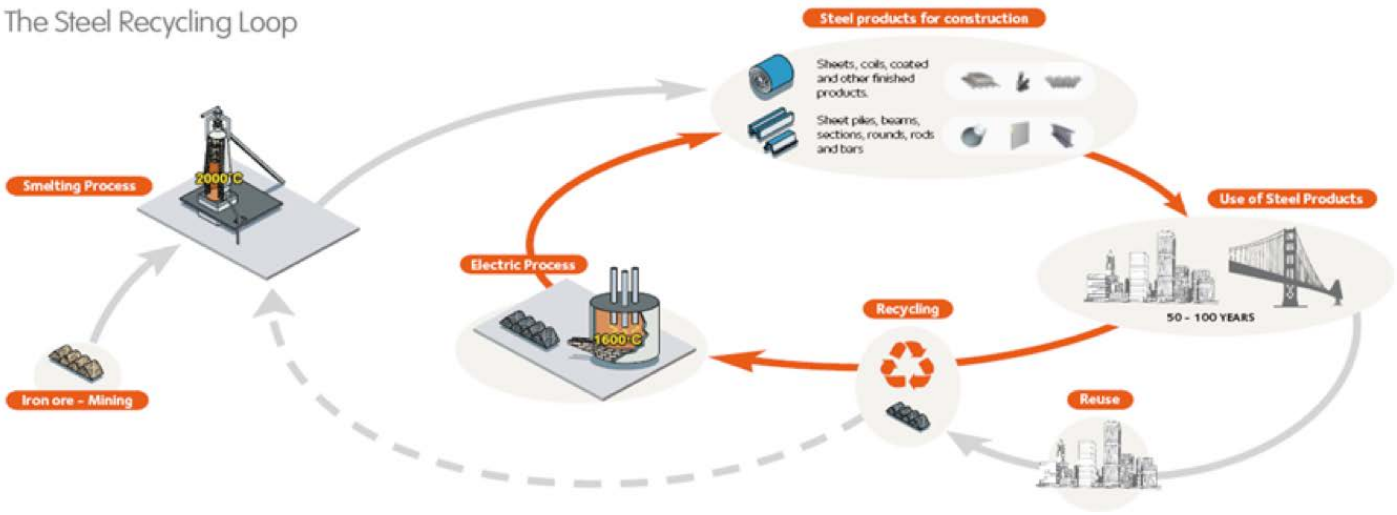
Sustainable steel

Steel in life-cycle assessed building solutions

At ArcelorMittal we are closely involved at all stages of steel's life cycle. That makes us ideally placed to provide full a life cycle assessment (LCA) for any building, however large or complicated the project may be.

Excluding low –or zero– energy buildings, the largest environmental impact of a building comes from energy consumption during the use phase. Once again, ArcelorMittal can provide a range of energy efficient solutions for building design.

Pre-painted steel such as Granite® HDX is produced on industrial lines that are designed to meet the most stringent environmental regulations. Those regulations cover surface treatments, solvent emissions, and the usage of harmful substances in the composition of the paint. ArcelorMittal's steel production sites already comply with standards such as ISO 14001 in this regard.
At the end of its life, organic coated steel is 100 % recyclable, just like all other steel products.



Sustainable steel

Environmental Product Declarations (EPDs) available

The Environmental Product Declarations (EPDs) for ArcelorMittal's Granite® and Estetic® products utilise life cycle assessment (LCA) methodology. The EPD has been peer-reviewed by an independent expert in compliance with ISO 14040/44 and EN 15804. The EPD considers inputs and outputs from provision of raw materials to manufacturing of pre-painted steel, as well as end-of-life recycling and disposal. EPDs contribute to credits in the 'materials' category of rating systems for green buildings.

ArcelorMittal's **Nature** collection of organic coated steels is specially designed for environmentally responsible construction. It can help designers comply with sustainability legislation and green building rating systems such as BREEAM (UK), LEED (USA), HQE (France).

BREEAM

Criteria	Weight	Relevant for steels solutions	Demonstration (examples)
Management	12%		
Health and Wellbeing	15%	HEA 02 Indoor Air Comfort	HEA 02 Eurofin VOC testing
Energy	15%		
Transport	9%		
Water	7%		
Materials	13.5%	MAT 01 Life Cycle Impacts MAT 03 Responsible sourcing of materials MAT 05 Designing for robustness MAT 06 Material efficiency	MAT 01 Product LCA + EPDs certified by third party MAT 03 ISO14001 certification MAT 05 Durability and protection measures to prevent damage to the vulnerable parts MAT 06 Levels of recycled content
Waste	8.5%	WST 01 Construction waste management	WST 01 Diversion of resources from landfill and construction resource efficiency
Land Use & Ecology	10%		
Pollution	10%		
Innovation	(10%)	INN Innovation	
Total	110%		

Disclaimer: Table relative to BREEAM UK new construction 2014. (Our) products/efforts contribute to credits, but BREEAM assessment is carried out at the building level. This list is indicative only and might be non-exhaustive.

Sustainable steel

Granite® HDX potential contribution

LEED

Criteria	Credits	Relevant for steels solutions	Demonstration (examples)
Location & transportation	16		
Sustainable sites	10		
Water efficiency	11		
Energy and atmosphere	33		
Material and resources	13	MR_ C1 Building life-cycle impact reduction MR_ C2 Building product disclosure and optimization - environmental product declarations MR_ C3 Building product disclosure and optimization - sourcing of raw materials MR_ C4 Building product disclosure and optimization - material ingredients MR_ CS Construction and demolition waste management	MR_C1 Data for whole-building Life Cycle MR_C2 Industry-wide EPDs (1/2 point) and product-specific EPDs (1 point). MR_C3 CSR report, (GRI (third-party verified) and U.N. Global Compact frameworks) available - Declaration of Scrap Content MR_C4 Chemical Abstract Service Registration Number (CASRN) - REACH declaration - Health product declaration MR_ CS Steel products generate very low or zero waste - its magnetic properties allow an easily separation from other waste streams and recycled
Indoor environmental quality	16		
Innovation	6	IN_ C1 Innovation	• EQ_C2 Eurofin VOC testing
Regional priority	4		
Total	110		

Disclaimer: Table relative to LEED v4 BD+C New Construction. (Our) products/efforts contribute to credits, but LEED assessment is carried out at the building level. This list is indicative only and might be non-exhaustive.

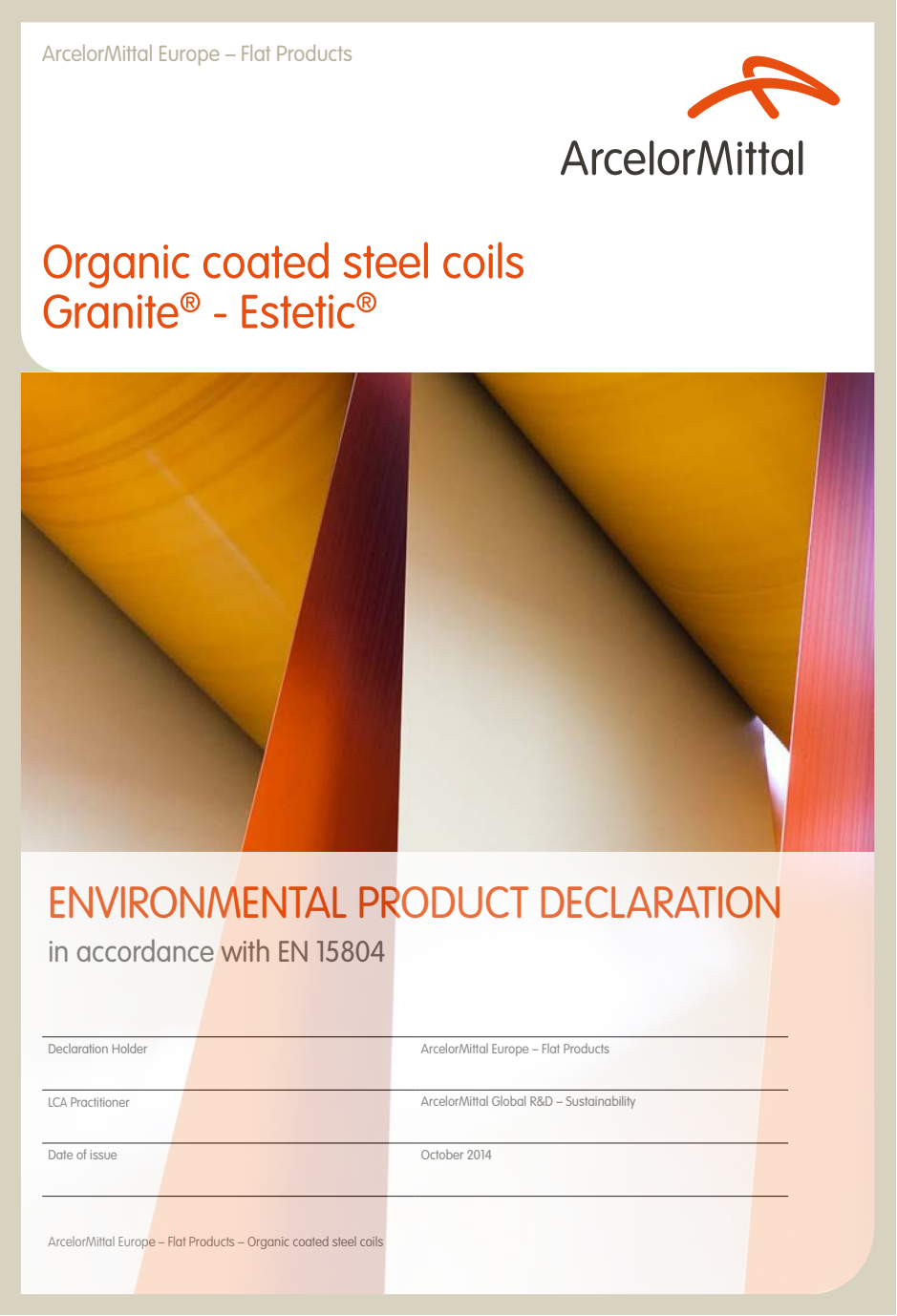
Additional contributions to other LEED categories can be obtained because of the product's specific characteristics (for example, high Surface Reflectance Index).

Sustainable steel

ArcelorMittal's dedicated team has more than 10 years of expertise in LCA. We can help customers to fully understand and exploit the sustainability aspects of ArcelorMittal's organic coated products. This includes integrating the content of our EPDs into dedicated assessments based on customer data. For example, including environmental loads from the transport of materials.

Granite® Environmental Product Declaration (EPD)

link to online version



Granite® HDX

Sustainable steel

free of chromates ®
Nspired by Nature
and heavy metals

The Nature Collection

For the past 15 years, ArcelorMittal has been developing and testing pre-painted steels which fulfil steel's promise as a strong and durable building material. Known as **Nature**, ArcelorMittal's pre-painted collection of steels for the building industry offers exceptional technical advantages and is well placed to respond to present and future environmental regulations.

The range doesn't contain hexavalent chromium or heavy metals (such as lead or hexavalent chromium complex) in the coating or surface treatment. This makes the **Nature** range fully compliant with Europe's REACH Regulation which covers the Registration, Evaluation, Authorisation, and Restriction of Chemicals. REACH aims to improve the protection of human health and the environment through better and earlier identification of the intrinsic properties of chemical substances.

In line with its proactive policy, ArcelorMittal continuously investigates alternatives to any substance of concern while maintaining product performance and durability.

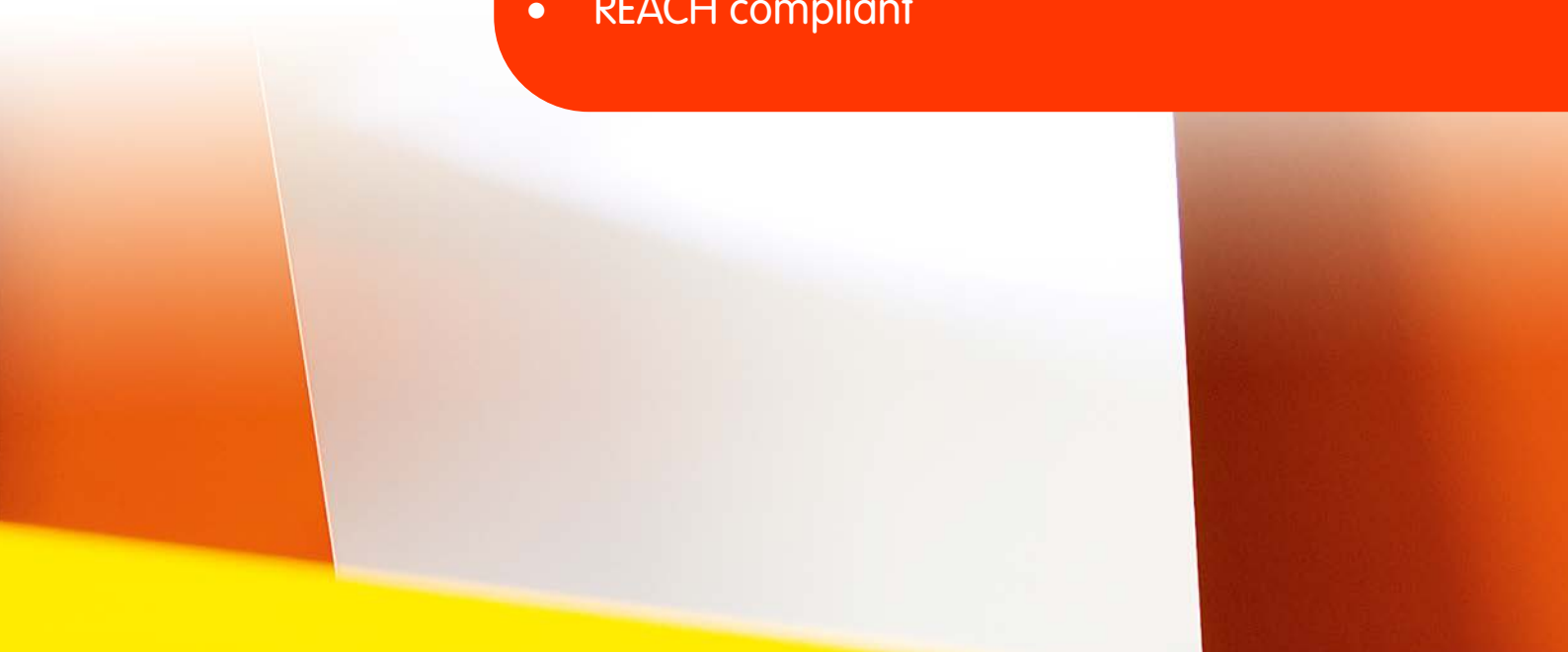
Granite® HDX

ArcelorMittal

Sustainable steel

Why ArcelorMittal organic coated steel is more sustainable

- Free of hexavalent chromium compounds (SVHC)
- Free of lead and other heavy materials
- Guaranteed up to 35 years
- Fully tested by our R&D experts to extreme corrosion and weathering conditions, both in the laboratory and outdoors
- Innovative aesthetics for a more harmonious integration in the environment
- Reflective coatings allow more comfortable living conditions, reducing indoor temperatures by a few degrees in hot and sunny environments
- A+ VOC emission according to French Directive 2011-321 ISO 16000-9
- REACH compliant



Granite® HDX

Processing

Granite® HDX can be processed by cold roll-forming, bending, or deep drawing without damaging the top surface. It can be joined using techniques such as clinching, riveting, and adhesive bonding.

Photograph: © Philippe Vandenameele

ArcelorMittal can provide technical guidance and storage recommendations to optimize the longevity of your projects.

The robustness of Granite® HDX is largely due to its grained aspect. No protective film is needed during processing. For processing steps which really require a protected surface, ArcelorMittal has already tested several temporary protective films. Do not hesitate to contact us for recommendations.

On-line documentation links:

Organic Coated User Manual

Maintenance Guide (pdf)

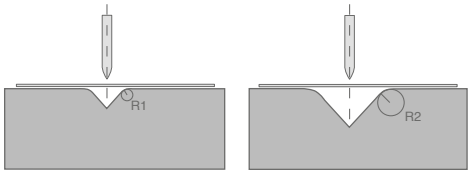
Storage guidelines for pre-painted metal (edited by ECCA)

Processing

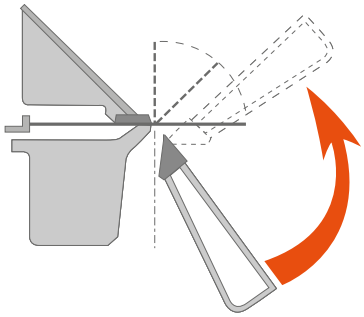
Granite® HDX is flexible, formable, and can withstand various forming processes without affecting its initial aesthetics or intrinsic mechanical properties.

Forming techniques

Bending

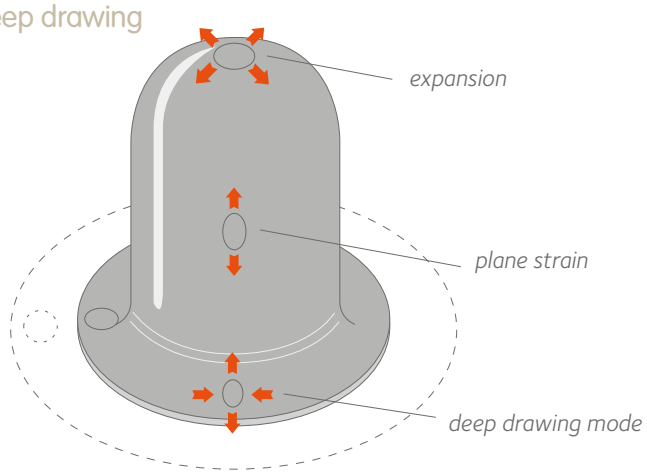


V-bending with narrow and wide dies



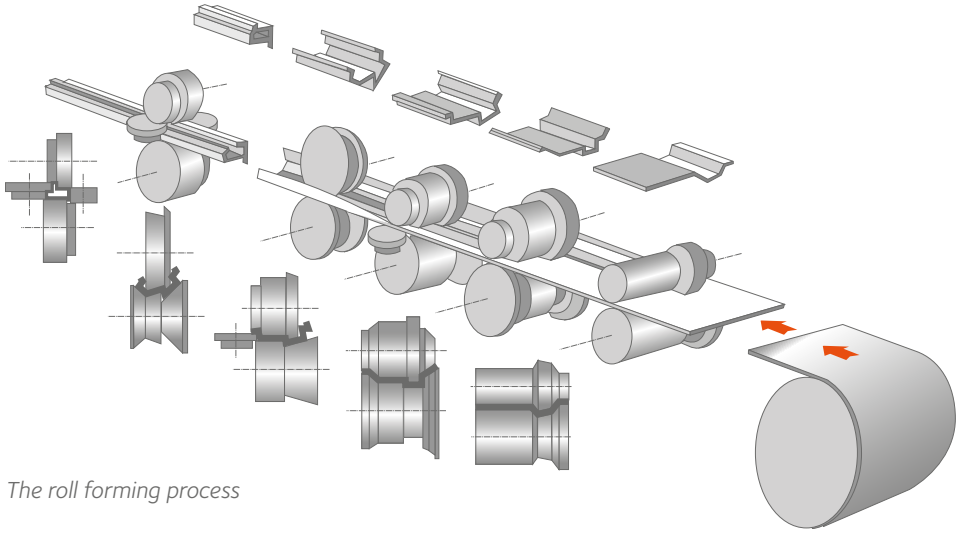
Principle of flap bending

Deep drawing



Different deformation modes in a drawn component

Roll forming



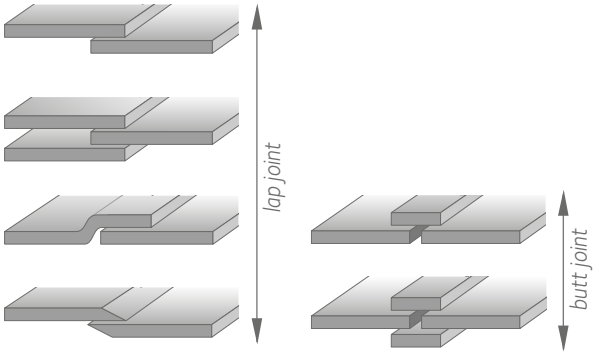
The roll forming process

Processing

Discover the organic coated user manual

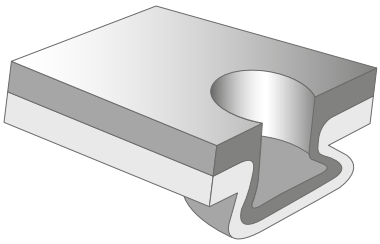
Joining techniques

Adhesive bonding

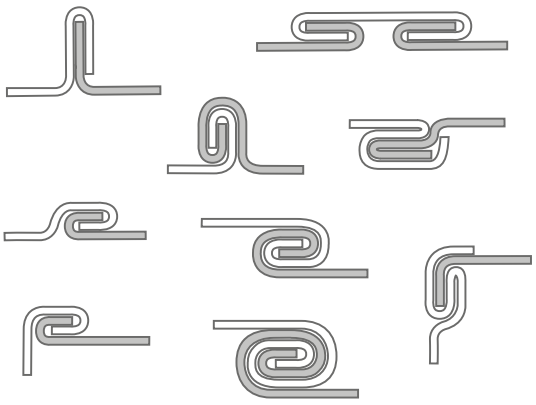


Recommended adhesive bonded joint configurations

Clinching

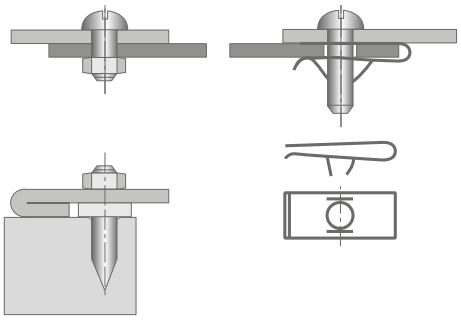


Lock-seaming



Different single and double lock seams

Other joining techniques



Various mechanical joining techniques (bolts, studs, clips etc)

Advanced services

ArcelorMittal has developed a wide technical and logistical service offer to help you develop your business.

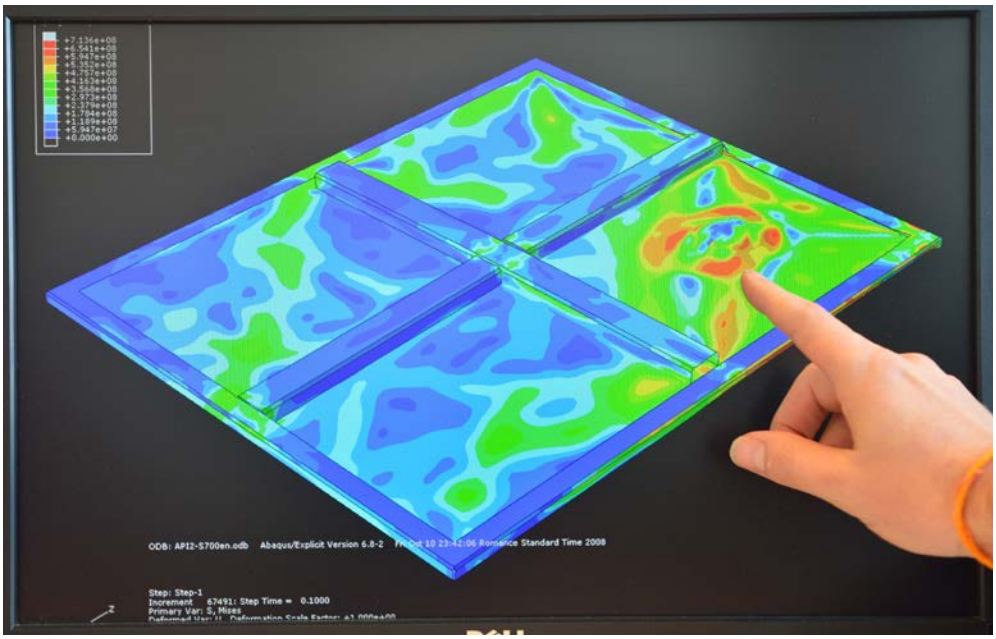
Technical support team

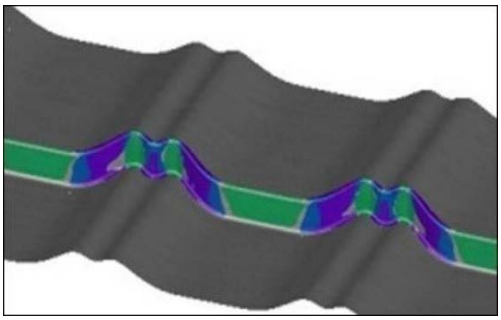
ArcelorMittal offers advice and expertise which integrates the latest building and environmental regulations applicable to your specific project.

ArcelorMittal's technical assistance to customers can be applied at all stages of product development, from initial design through to serial production.

We can help you to take every advantage of the benefits Granite® HDX can offer including:

- Identifying the most suitable steel grade for your application
- Cost optimisation and process improvements using finite element simulations
- Improving the quality and durability of your product
- Technical support during production.



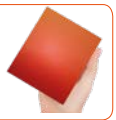


Simulation of a roof tile panel
Photographs: © ArcelorMittal Global R&D

Advanced services

Sample webshop

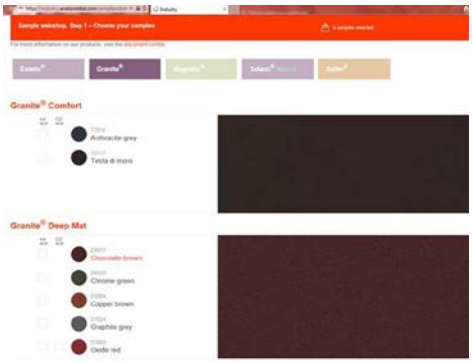
Link to order samples



Colour matching

ArcelorMittal has developed a broad colour palette for Granite® HDX. The same colours are available from all our production lines, ensuring colour consistency and quality.

Physical samples can be obtained on request.



For projects which require specific colours to create a unique identity or match the local environment, we offer a comprehensive colour matching service. A minimum order quantity for matched colours is required. Do not hesitate to consult our technical and sales support people for further information.

Logistics

Quick and reliable deliveries are key success factor in construction projects. ArcelorMittal has implemented a comprehensive logistics service which allows you to define your project schedule in complete confidence.

Late colour specification and short lead times are just two of the services that can be offered for specific projects.

Contact us to find out more.

industry.arcelormittal.com/getintouch

Advanced services

https://youtu.be/PF0ItMeo0vA

Objects and instructions available on constructalia.com

Building Information Modelling (BIM)

BIM digitally integrates the aesthetic design and technical details of a construction project into one information package. BIM gives everyone involved in the construction process a digital prototype of the building before it is built. It allows changes to be identified and implemented earlier, reducing cost and delays.

ArcelorMittal Europe – Flat Products is the first steelmaker in the world to provide BIM details for our extensive portfolio of aesthetic products for construction.

As the information is virtual, changes to one component of the building are automatically reflected across the BIM. Safety is also enhanced as materials can be checked to ensure they meet relevant fire or security standards.

Granite® HDX BIM objects

Each object typically contains:

- Technical data about the material and a set of design-software files
- 3D data (indicating texture) so that every steel product for construction can be modeled in virtual reality software.
- Product application details such as a case study.

In addition to the objects, we make available:

- Descriptions of the contents of the downloadable files and specific instructions for Revit users.
- A series of examples of finalised 3D renders for different types of buildings.
- Small 3D videos of building components such as cassettes and profiles made of ArcelorMittal steel.

Projects

Arcus College Campus in Heerlen (NL)

Architect: IAA Architecten
2011 - 2014
Client: Arcus College
Contractor: ZND Nedicom
Steel facades: Jack Muller B.V.
Photographs: © Little Planet - www.littleplanet.be

"The guarantee was highly attractive to both IAA Architecten and the customer, and could not be matched by the proposed aluminium solution"

noted Anita van Stiphout, commercial manager at Jack Muller B.V. which sourced the Granite® HDX coils from ArcelorMittal and cut them into sheets.

Projects

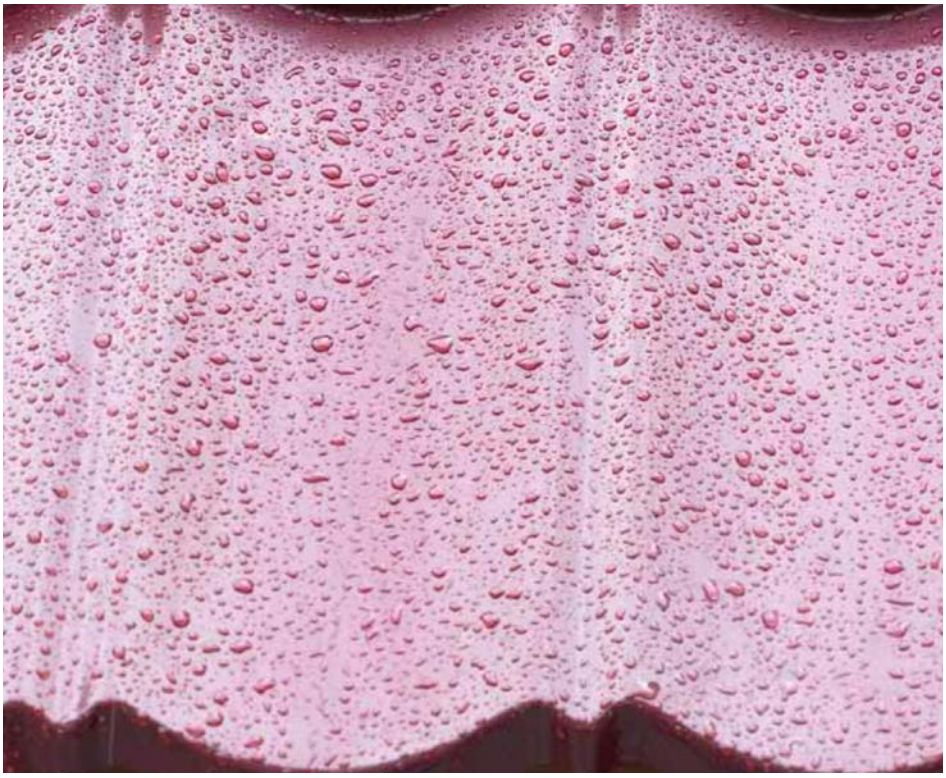
Residential roofs (Russia)

Client: Grand Line
Photographs: © Grand Line, © Philippe Vandenameele

Grand Line is utilising ArcelorMittal's Granite® HDX for its "Quarzit" range because it offers excellent performance in the harsh Russian climate.

"We searched for a product that would offer the same outstanding colour and gloss retention and found Granite® HDX from ArcelorMittal for our Quarzit range."

Sergey Namestnikov, head of marketing.



Projects

Municipal services building (NL)Apeldoorn Post Zuid

Architect: Courage Architecten & Mies Architectuur
2013
Client: Municipality Apeldoorn
Engineering Firm: Nieman Raadgevende Ingenieurs
Contractor: Hegeman bv
Photographs: © Lars Courage

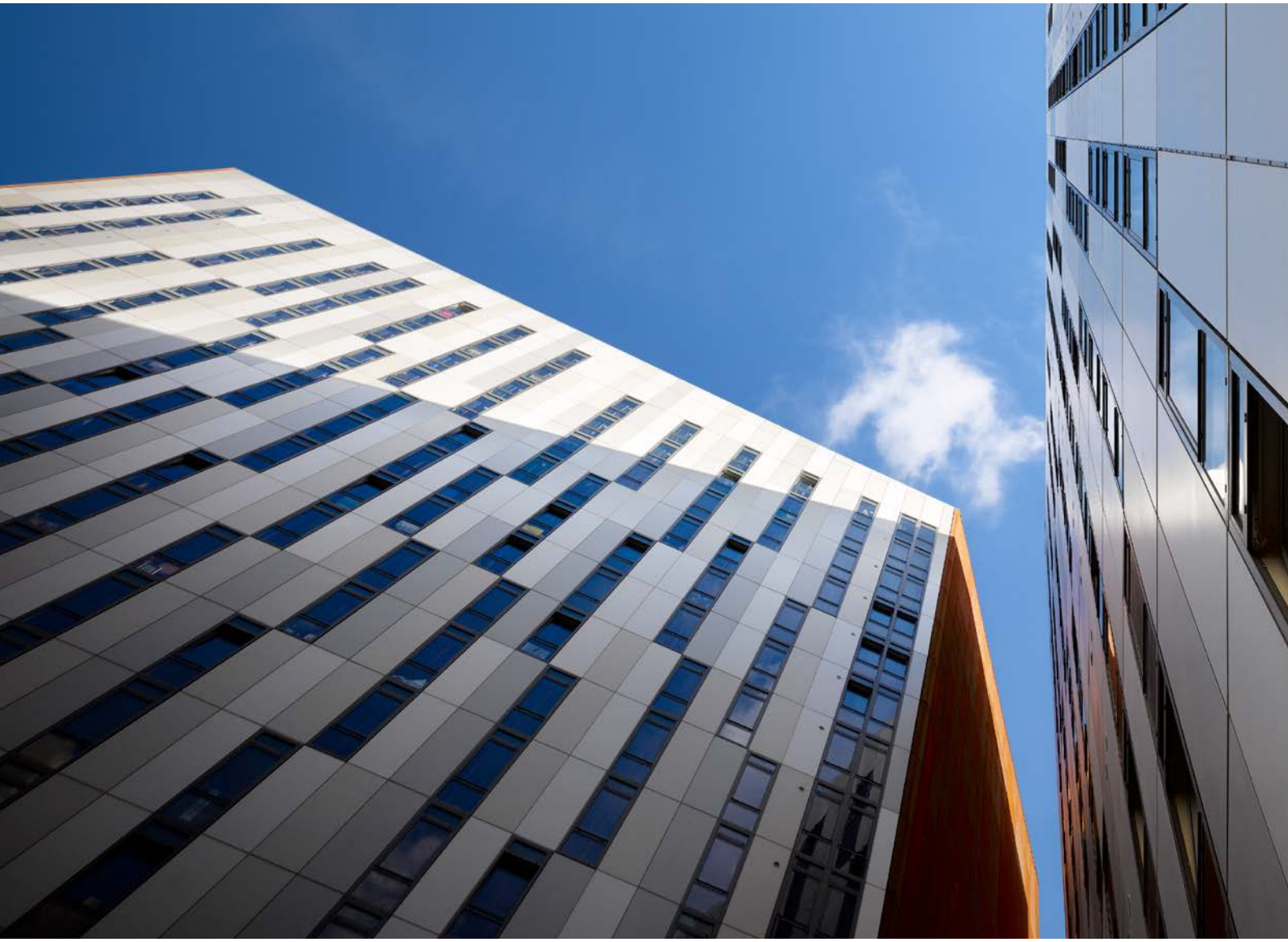
The sandwich panels used for the metallic parts of the cladding are made of Granite® HDX pre-painted steel (S280GD+Z225) in jet black G9005. Instead of the coating's standard gloss of 30 GU, a gloss of only 10 GU was requested for this project.

Projects

Parkway Gate
Manchester (UK)

Architect: Ian Simpson Architects
2001 - 2003
Client: Downing Property Group
Photograph: © Daniel Hopkinson

The courtyard facade is composed of muted shades of Granite® HDX coated steel that echo the glazed brick lightwells typical of the city's Victorian warehouses. This pre-painted steel guarantees ideal corrosion protection and colour stability in harsh environmental conditions.



ArcelorMittal

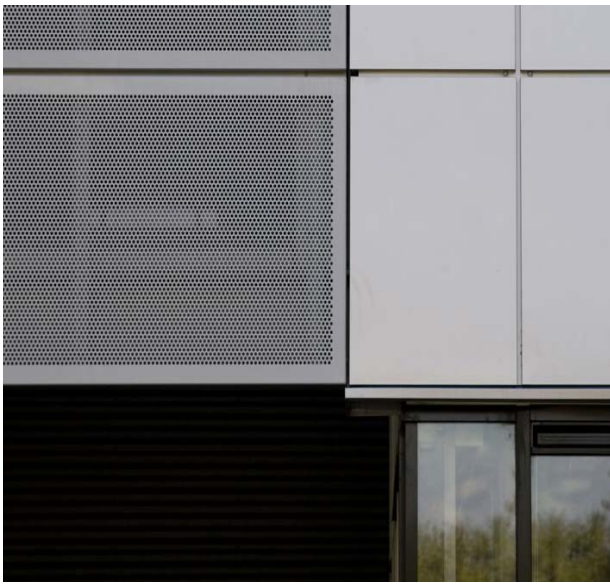
Projects

Porsche Centrum Groningen (NL)

Architect: VBJ Architecten, Veenendaal
2009
Main Contractor: Groothuis Bouwgroep
Cladding Contractor: PIB HollandGroep b.v., Nijkerk
Cladding System: Rain screen facade,
Metal Cladding and Silk-C Architectural Panels by SBC Holland Groep.
Client: Pon Onroerendgoed, Almere
Photographs: © Mark Sekuur

Fully complying with the corporate identity and design guidelines of Porsche, the new building of the official Porsche Car dealer in North Netherlands is an example of striking, contemporary architecture reflecting the characteristics of the company: modern, with a sense of quality that meets the highest standards.

The façade of the so called "Black Box", the workshop, is made of Granite® HDX G9006 metallised colour pre-coated metal cladding systems and a transparent ventilated rain screen system was used for the cladding of the car park.



ArcelorMittal Europe – Flat Products
24-26, boulevard d'Avranches
L-1160 Luxembourg
industry.arcelormittal.com

Useful links

Steel advisor

web landing page Granite® HDX

Granite® HDX on Constructalia

Organic Coated user manual

Storage user guide (ECCA)

PR-BR-HDX-EN 06/2021 – Published by ArcelorMittal Europe Communications